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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)

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☐ *Additional inventors are being named on th____ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

NON-CENTRALIZED CHANNEL STRUCTURES FOR MIDDLEWARE

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* **2**

☐ Drawing(s) *Number of Sheets* **0**

☐ Application Data Sheet. See 37 CFR 1.76

☐ CD(s), Number

☐ Other (specify)

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☒ Applicant claims small entity status. See 37 CFR 1.27.

☒ A check or money order is enclosed to cover the filing fees

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FILING FEE AMOUNT ($) **$80.00**

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE

Date **3/5/04**

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USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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NON-CENTRALIZED CHANNEL STRUCTURES FOR MIDDLEWARE

The invention is a different method to implement object brokering to tie together different software objects (through middleware).

In the implementation of SCA (software communications architecture)-compliant software-defined-radio (SDR), a military standard, data channels are necessarily directed through CORBA, which is a separate process residing in a general-purpose-processor (GPP). A separate channel, under the control of the CORBA ORB or some other middleware, is established between two objects that require a connection. This separate channel can take the form of shared memory between two objects in separate threads within the GPP or some other form of direct channel. By bypassing the ORB(or some other form of middleware) through this channel, several benefits can be reaped:

highly efficient connection

easy upgrade path (supported by middleware)

complements refined software radio design methodology (supports easy partitioning of functionality)

easier integration of reconfigurable computing platforms

allows the direct connection of different platforms with little GPP overhead

isolates reconfigurable computing modules

eases integration of different reconfigurable computing platforms

extension of middleware connections outside GPP allows for efficient embodiment of customized connectivity approaches (switching fabrics)

eases restrictions required to support power management

eases integration of ASICs cores into system design

eases development

Increases scalability of design (by reducing the impact of the GPP bottleneck)

Examples of such functionality can be implemented through strategies such as director memory access or a shared bus.

All current implementations of middleware are designed explicitly to isolated different objects from each other, and, hence use a centralized form of control. By extending the functionality of the middleware into the interface of each of these objects and establishing a

separate (but controlled) data channel, this middleware concept should be far better suited for SDR applications.

This invention significantly reduces the overhead inherent to the implementation of middleware (like an ORB) while at the same time maintaining full compliance with the software designed to use the middleware (like the SCA). It has been shown that an SCA compliant waveform, as much as 76% of the system resources are occupied by the overhead incurred by the middleware. This concept is specifically designed for software-defined-radio implementations, but with the SCA specifically in mind. All new military communications hardware transmitting in channels above 2 GHz are required to use this standard.